

CALIBRATION STANDARD REQUIREMENT
FOR A
TEMPERATURE HUMIDITY CHAMBER

PROCUREMENT PACKAGE

Prepared by: Naval Warfare Assessment Division
Measurement Science Directorate
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CALIBRATION STANDARD REQUIREMENT FOR A
TEMPERATURE HUMIDITY CHAMBER

1. SCOPE

1.1 Scope. This requirement defines the mechanical, electrical, and electronic characteristics for a Temperature Humidity Chamber. This equipment is intended to be used by Navy personnel in shipboard and shorebased laboratories to calibrate or to assist in the calibration of thermo-humidigraphs, humidity and temperature recorders, psychrometers, and heat stress monitors. For the purposes of this requirement, the Temperature Humidity Chamber shall be referred to as the THC.

2. APPLICABLE DOCUMENTS

2.1 Controlling Specifications. MIL-T-28800, "Military Specification, Test Equipment for use with Electrical and Electronic Equipment, General specification for," and all documents referenced therein of the issues in effect on the date of this solicitation shall form a part of this requirement.

3. REQUIREMENTS

3.1 General. The THC shall conform to the Type II, Class 5, Style E requirements as specified in MIL-T-28800 for Navy shipboard and shorebased use as modified below. The use of material restricted for Navy use shall be governed by MIL-T-28800.

3.1.1 Design and Construction. The THC design and construction shall meet the requirements of MIL-T-28800 for Type II equipment.

3.1.2 Power Requirements. The THC shall operate from a source of 103.5V to 126.5V at 50 and 60 Hz +/-5% single-phase, input power or a source of 440 volts +/-10% three phase and 230 volts +/-10% single phase, 50 and 60 Hz +/-5% input power as specified in MIL-T-28800.

3.1.2.1 Fuses or Circuit Breakers. Fuses or circuit breakers shall be provided. If circuit breakers are used, both sides of the power source shall be automatically disconnected from the equipment in the event of excessive current. If fuses are used, only the line side of the input power line, as defined by MIL-C-28777, shall be fused. Fuses or circuit breakers shall be readily accessible.

3.1.2.2 Power Connection. The requirements for power source connections shall be in accordance with MIL-T-28800 with a 6 foot (1.8 m) minimum length cord.

3.1.3 Dimensions and Weight. The THC shall be of a size to fit through a 28 inch (71 cm) wide X 60 inch (152 cm) tall door

opening with minimal disassembly. Minimal disassembly includes only easily removable doors or external fixtures. Structural components shall not be disassembled. All disassembly and re-assembly shall require less than 90 minutes. Maximum dimensions shall not exceed the following: 32 inches (81 cm) X 36 inches (91 cm) X 60 inches (152 cm). The THC weight shall not exceed 500 pounds (227 kg).

3.1.3.1 Working Volume Dimensions. The THC shall have a minimum working volume or interior chamber size of 15 inches (38 cm) in width, 12 inches (30.5 cm) in height, and 12 inches (30.5 cm) in depth.

3.1.4 Lithium Batteries. Per MIL-T-28800, lithium batteries are prohibited without prior authorization. A request for approval for the use of lithium batteries, including those encapsulated in integrated circuits, shall be submitted to the procuring activity at the time of submission of proposals. Approval shall apply only to the specific model proposed.

3.2 Environmental Requirements. The THC shall meet the environmental requirements for a Type II, Class 5, Style E equipment with the deviations specified below.

3.2.1 Temperature and Humidity. The THC shall meet the conditions below:

	<u>Temperature (°C)</u>	<u>Relative Humidity (%)</u>
Operating	10 to 30	95
	30 to 40	75
Non-operating	-40 to 70	Not Controlled

3.2.2 Electromagnetic Compatibility. The electromagnetic compatibility requirements of MIL-T-28800 are limited to the following areas: CE01, CE03, CS01, CS02, CS06, RE01, RE02 (14 kHz to 1 Ghz), and RS03.

3.3 Reliability. type II reliability requirements are as specified in MIL-T-28800.

3.3.1 Calibration Interval. The THC shall have an 85% or greater probability of remaining within tolerances of all requirements at the end of a 12 month period.

3.4 Maintainability. The THC shall meet the Type II maintainability requirements as specified in MIL-T-28800 except the lowest discrete component shall be defined as a replaceable assembly. Certification time shall not exceed 60 minutes.

3.5 Performance Requirements. The THC shall provide the following capability as specified below. Unless otherwise indicted, all requirements shall be met following a 30-minute warm-up period.

3.5.1 Temperature Requirements. The THC shall meet the following temperature requirements.

3.5.1.1 Temperature Accuracy. The THC shall have a temperature set point control tolerance of $\pm 0.25^{\circ}\text{C}$ or better.

3.5.1.2 Temperature Set Point Control. The THC shall have a temperature set point control tolerance of $\pm 0.25^{\circ}\text{C}$ or better.

3.5.1.3 Temperature Range. The THC shall have a temperature range of -60°C to $+100^{\circ}\text{C}$ or better.

3.5.1.4 Temperature Resolution. The THC Shall have a temperature resolution of $\pm 0.1^{\circ}\text{C}$ or better.

3.5.1.5 Temperature Slew Time. The THC shall have a maximum heating slew time of 20 minutes form 20°C to 100°C and a maximum cooling time of 60 minutes form 20°C to -60°C .

3.5.1.6 Temperature Stabilization Time. The THC shall stabilize at the set point within the tolerance specified in 3.5.1.1 in a minimum time of 25 minutes. The stabilization time is defined as the time the THC requires to reach temperature equilibrium after it has slewed to within 0.5°C of the set point.

3.5.2 Relative Humidity Requirements. The THC shall meet the following Relative Humidity (RH) requirements.

3.5.2.1 Relative Humidity Accuracy. The THC shall have a relative humidity accuracy of $\pm 2\%$ RH or better.

3.5.2.2 Relative Humidity Set Point Control. The THC shall have a relative humidity set point control tolerance of $\pm 2\%$ RH.

3.5.2.3 Relative Humidity Range. The THC shall have a minimum humidity range of 20 to 98% relative humidity in the 20°C to 80°C temperature range.

3.5.2.4 Dew Point Limit. The THC shall have a dew point limit of 3°C or less.

3.5.2.5 Relative Humidity Resolution. The THC shall have a relative humidity resolution of $\pm 0.1\%$ RH or better.

3.5.2.6 Relative Humidity Stabilization Time. The THC shall stabilize at the set point within the tolerance specified in paragraph 3.5.2.1 in a minimum time of 20 minutes. The stabilization time is defined as the time the THC requires to reach relative humidity equilibrium after it has slewed to within 2% RH of the set point.

3.6 Operating Requirements. the THC shall provide the following capabilities.

3.6.1 Front Panel Control Requirements. All modes and functions shall be operable using front panel controls. The locations and labeling of indicators, controls, and switches shall be provided for maximum clarity and easily understood operation without reference to tables, charts, or flow diagrams.

3.6.2 Display. The THC shall meet the following display requirements. All the displays shall be easily operated from the front panel.

3.6.2.1 Humidity Display. The THC shall have a humidity display that displays the following humidity units: Percent RH.

3.6.2.2 Temperature Display. The THC shall have a temperature display that reads in °C or °F.

3.6.3 High Temperature Cut-Off Switch. The THC shall have a temperature cut-off switch to protect the test chamber from over range temperature conditions.

3.7 Manual. At least two copies of an operation and maintenance manual shall be provided. The manual shall meet the requirements of MIL-M-7298.

3.7.1 Calibration Procedure. The manual shall provide a THC calibration procedure in accordance with MIL-M-38793.

3.8 Accessories. The THC shall include the following:

3.8.1 The THC shall have an 8" X 8" window with a manual wiper.

3.8.2 The THC shall have a vapor sealed interior light.

3.8.3 The THC shall have a 2-inch diameter access port with two plugs.

3.8.4 The THC shall have one adjustable removable shelf.

3.8.5 The THC shall have a method to collect water from the chamber.